REMARKS

Prior to entry of this paper, Claims 28-34 were pending. In this paper, Claims 29, 30 and 34 are amended. No new claims are added. No new matter is added by way of these amendments. For the reasons discussed in detail below, Applicant submits that the pending claims are patentable over the art of record and respectfully request that the Examiner pass this application to issue.

Claim Rejections Under 35 U.S.C. §112

The Office Action rejected claims 28-34 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. In particular, the Office Action states that regarding Claim 28, "there is nothing in FIGURE 3 or the specification which even vaguely suggests that a plurality of data structure types is assigned to each and every NAT connection datum in the data store." The Office Action further states that there is no indication in the specification of the process by which a determination is made of "the data structure type best suited to the NAT connection datum," or how the "best suited" data structure is correlated to a request for a NAT connection datum. Claims 30 and 34 are rejected on the same basis, and claims 29 and 31-33 being rejected for being dependent from a rejected base claim. The Applicants respectfully traverse this rejection.

With respect to the rejections of Claim 28, the Applicants respectfully direct the Examiner to FIGURE 3 in conjunction with FIGURES 6-8, and related text in the Applicants' specification. FIGURE 3 clearly illustrates a complex data structure that includes trie 104 and list 106 data structures. Each of the trie 104 and list 106 data structures provide parallel access to data stored in the data store 108. See also, the Applicants' specification at page 9, lines 3-11. FIGURE 6 illustrates an example of a trie data structure 104 and a list data structure 107 in more detail. The list data structure 107 includes IP and port information (128 and 130) that points to specific data objects that reside within a data store 109. Similarly, FIGURE 7 illustrates an example of both list 106 and trie 103 data structures. The trie data structure 103 again illustrates use of IP and port information to point to a data object 110 within the data store 111. Thus, the specification and the

figures provide support "for each stored NAT connection datum, assigning each of a plurality of data structure types to the same stored NAT connection datum.

Moreover, the specification fully describes "determining one of the plurality of data structure types best suited to the NAT connection datum." For example, page 9 lines 22-23 of the Applicants' specification states that "[a] trie retrieval function is generally employed to find a single container object when at least one of the trie keys that give access to the object are known." Page 10 lines 5-6 of the Applicants' specification states that "[t]he list retrieval functions are used whenever the appliance needs to sequentially access a group of container objects." In addition, the specification further states that "both trie and list functions may be used when a request is received for information about all of the network address translation connection objects.... In this case, the initiator object is retrieved using the trie retrieval function...using the member list...the connection objects collected by the initiator are sequentially retrieved." See Applicants' specification at page 10, lines 11-16. Thus, the Applicants respectfully submit that the subject in the claims is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Furthermore, the Office Action states that a data structure as defined by Microsoft Computer Dictionary, Fifth Edition, is "an organizational scheme, such as a record or array, that can be applied to data to facilitate interpreting the data or performing operations on it." According to the Office Action, it is unclear "how an array of binary digits can be characterized as a plurality of data structure types." The Applicants are confused by such a statement. First, the Applicants do not limit its use of data structures to merely Microsoft's definition. However, using this definition, it appears that it describes a data structure as an organizational scheme. That is, it is how binary digits may be organized that constitutes a data structure type. Different organizational schemes of binary digits therefore, may describe different data structure types. The Applicants describe and illustrate different data structures, a trie data structure type, and a list data structure type. The Applicants also disclose a hash data structure type. Thus, the Applicants describe a plurality of data structure types. The Applicants' specification further describes how to perform various operations on binary digits using the plurality of data structure types. Thus, for at least these reasons, the rejection of Claim 28

under §112, first paragraph, should be withdrawn. Similarly, because claims 30 and 34 include limitations similar to the above, and claims 29 and 31-33 depend from claims 28 and 30, respectively, the rejection of these claims should also be withdrawn.

The Office Action further rejects claims 30 under 35 U.S.C. §112, second paragraph, as being indefinite, because in Claim 30, it is unclear why it is determined whether 'one of the first object retrieval component or the second object retrieval component to employ for retrieval.." when the next limitation recites "employs the first object retrieval component to retrieve the connection data object." In addition, the Office Action cites other concerns regarding claim 30 on page 5 second paragraph of the Office Action. In response to these rejections, the Applicants have amended claim 30 to address each of the Examiner's issues regarding the metes and bounds of the claim language. Thus, the Applicants respectfully submit that the rejections under 35 U.S.C. §112, second paragraph are now moot and should be withdrawn. Similarly, because claims 31-33 depend from claim 30, and were rejected based on the rejected base claim, the rejection for these claims should also be withdrawn.

The Office Action rejects claim 34 under 35 U.S.C. §112, second paragraph, as being indefinite, because it could not be determined what comprises "a different data structure," and what comprises "the third data retrieval means." In response, the Applicants have amended claim 34 to make it clear that the different data structure type is "different from the trie data structure type." The specification describes several data structure types, including a trie data structure type, a list data structure type, and a hash data structure type. Thus, the 'different data structure type from the trie data structure type," may be, for example, a list data structure or a hash data structure type. Moreover, the third data retrieval means may include, for example, such elements as those disclosed in FIGURES 2, 3, and 11, in conjunction with the related text in the Applicants' specification. Thus, the Applicants respectfully submit that the claim language of claim 34 is definite. Therefore, for at least these reasons, the rejection of claim 34 under 35 U.S.C. §112, second paragraph, should be withdrawn.

Provisional Application

The Office Action as indicated that under 35 U.S.C. §119(e) "due to lack of support in the provisional application for the [noted] claim limitations, the instant non-provisional application will not be afford the priority date of the provisional application." The Applicants respectfully traverse this rejection of the provisional application.

The Applicants respectfully submit that the provisional application provides a written description of the application ...to enable any person skilled in the art to which it pertains to practice the invention as supported in the non-provisional application. For example, Claim 30 recites, among other things, a first object retrieval component that is configured to employ a first data structure type to retrieve each of the plurality of connection data objects from the data store, and a second object retrieval component that is configured to employ a second data structure type to retrieve each of the plurality of connection data objects from the data store.

As shown in the provisional application at pages B6-B11 is a (network address translation) NAT example of a combination of two data structure types, a trie and a list data structure useable with an object accessible via 32-bit IP address keys. Pages B26-B28 of the provisional application further illustrates list and trie data structure types for a hierarchical virtual server with virtual port and (IP) addresses. Thus, the provisional application does enable first and second object retrieval components that are configured to employ first or second data structure types to retrieve each of the plurality of connection data objects from the data store.

Claim 30 further recites, among other things, determining one of the first object retrieval component or the second object retrieval component for retrieval of the connection data object based on the first request. Claim 30 also recites employing the determined object retrieval component to retrieve the connection data object. Page A5 of the provisional application describes a trie data structure type that allows constant time lookups via keyed retrieval paths. Furthermore, page A5 also indicates that an object is accessible via a primary key path through a trie, and possibly a secondary key path or via lists data structure types. Page B14 of the provisional application further describes an example of using

the trie nodes to find a connection object, while B16 illustrates an iteration example using a list data structure type. Pages B21-B24 provides additional information showing use of iterators to access the connection datum. It is well known in the art that iterators may be functional components of a computing system, such as a server, and may be used to determine and retrieve an object. Thus, the provisional enables any person skilled in the art to which it pertains to practice the invention to practice the invention. Furthermore, claim 34 includes similar, albeit it different, limitations as claim 30. Thus, for at least these reasons, the provisional application enables at least claims 30 and 34.

In addition, claim 33 recites that a first and a second data structure types are trie and list data structure types, respectively. As indicated above, the provisional application describes trie and list data structure types, with figures. Thus, for at least this reason, the provisional application enables at least claim 33.

Moreover, claim 32 recites the determination being based on whether the first request includes a key identifying the connection data object. In addition, claim 29 recites identifying a key in the request for NAT connection datum, dividing the key into segments, and employing each segment to search one of the plurality of data structure types to locate the request NAT connection datum. The Applicants further submit that these claims are enabled by the provisional application. For example, at page A2 of the provisional application, it is disclosed that each data object may be accessed via one or more unique keys. Some of these data object keys used include IP address and port numbers. See page A3 of the provisional application. On page B7 of the provisional application is an example trie data structure type that illustrates an object accessible via two IP address keys, which have been divided into key segments. Pages B16 and B22-B23 further illustrate an iterator example useable for searching one of the data structure types to locate requested NAT connection datum. Thus, for at least these reasons, claims 29 and 32 are enabled by the provisional application.

Claim Rejections Under 35 U.S.C. §102

The Office Action rejected claims 28-32 and 34 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,324,177 to Howes et al. ("Howes"). The Applicants respectfully traverse this rejection.

The Applicants respectfully submit that Howes does not disclose or suggest each of the claim limitations. For example, claim 28 recites a method for managing NAT connections that includes, among other things, "assigning each of a plurality of data structure types to the same stored NAT connection datum." Nowhere does Howes disclose or suggest a plurality of data structure types, let alone assigning each of the plurality to the same stored NAT connection datum.

The Office Action suggests that Howes describes a plurality of data structure types that includes a pointer and a linked list hash chain as data structure types. Instead, Howes describes an arrangement of data structures within a Local Director 200 that keeps track of the virtual machines implemented on the Local Director 200. See Howes figure 2 and Col 36-38. The data structures are arranged using pointers to a next connection object on its linked list hash chain. (Howes, Col 8, lines 11-13). Thus, what Howes describes is a single linked list hash chain data structure type that uses pointers to enable the linking elements within the linked list. Pointers are not themselves a data structure type, however. As defined in Microsoft Computer Dictionary Fourth Edition (copyright 1999), a pointer is a "variable that contains the memory location (address) of some data rather than the data itself." Thus, a pointer is not an organizational scheme, such as a record or array, as used by the Examiner. Therefore, a pointer is not a data structure type. Thus, Howes does not disclose or suggest a plurality of data structure types.

Moreover, in Howes, each of a plurality of data structures types are not assigned to the same stored connection datum as required by the claimed invention of the Applicants. Rather, as shown in Howes' figure 2 and figures 3a-3c, the pointers are used to point to other objects in the linked list, and are not directly assigned to the same connection datum as required by the Applicants' claims. Therefore, for at least these reasons, claim 28 is not anticipated nor made obvious by Howes, and is thus in condition for allowance.

Moreover, independent Claims 30 and 34 include similar, albeit different, limitations as those recited in independent Claim 28. For example, claim 30 recites, among other things, a first data structure type that is useable to retrieve each of the plurality of connection data objects and a second data structure that is also useable to retrieve each of the plurality of connection data objects. Dependent Claim 33 further illustrates that the data structure types include a trie data structure and a list data structure type. Claim 34 recites, among other things, a first data retrieval means and a second data retrieval means, each of which are useable for retrieving each of the plurality of connection data objects. The first data retrieval means employs a trie data structure type, and the second data retrieval means employs a data structure type. Thus, because the cited reference does not teach or suggest such limitations, Howes does not anticipate nor make obvious at least claims 30 and 34. Therefore, these claims are allowable for at least the same reasons as new claim 28.

In addition, dependent Claims 29, and 31-33 depend from independent Claims 28 and 30, respectively. Therefore, for substantially the same reasons as for their corresponding independent claims, Claims 29 and 31-33 are also in condition for allowance. Therefore, Applicants respectfully submit that Claims 28-34 are in condition for allowance and should be allowed to issue.

CONCLUSION

By the foregoing explanations, Applicants believe that this response has responded fully to all of the concerns expressed in the Office Action, and believe that it has placed each of the pending claims in condition for immediate allowance. Early favorable action in the form of a Notice of Allowance is urged. Should any further aspects of the application remain unresolved, the Examiner is invited to telephone Applicants' attorney at the number listed below.

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Respectfully submitted,

By _____

Jamie L. Wiegand
Registration No.: 52,361
DARBY & DARBY P.C.
P.O. Box 5257
New York, New York 10150-5257
(206) 262-8900
(212) 527-7701 (Fax)
Attorneys/Agents For Applicant